10/812732

(12) UK Patent Application (19) GB (11) 2 129 113 A

(21) Application No 8327313
(22) Date of filing 12 Oct 1983
(30) Priority data
(31) 8229622
(32) 16 Oct 1982
(33) United Kingdom (GB)
(43) Application published 10 May 1984
(51) INT CL³ F25D 13/00
(52) Domestic classification F4H 10 1B 8
(56) Documents cited
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EP 0058821
(58) Field of search F4H
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(54) Refrigeration assembly

(57) A commercial refrigeration assembly comprises two walls and a top panel (3) fitted together at the corner of existing walls to form an enclosure in the form of a cold room, and a sealed refrigeration system for fitting to the enclosure to refrigerate the internal chamber. The refrigeration system includes an evaporator (6) to cool the air, and a condenser (8) for removing heat taken in by the evaporator (6) with a fan (7) for drawing air from the chamber over the evaporator (6) to cool the air. The system is removable as a self-contained unit from the enclosure which has an aperture (4) enabling air to be drawn by the fan (7) from the chamber, cooled by the evaporator (6) and thence returned to the chamber. The evaporator (6) and fan (7) are enclosed by an insulated box (13) which fits over the aperture (4), the condenser (8) lying outside the box (13). A drip tray (9) beneath the evaporator is connected to a vaporizer tray beneath the condenser.

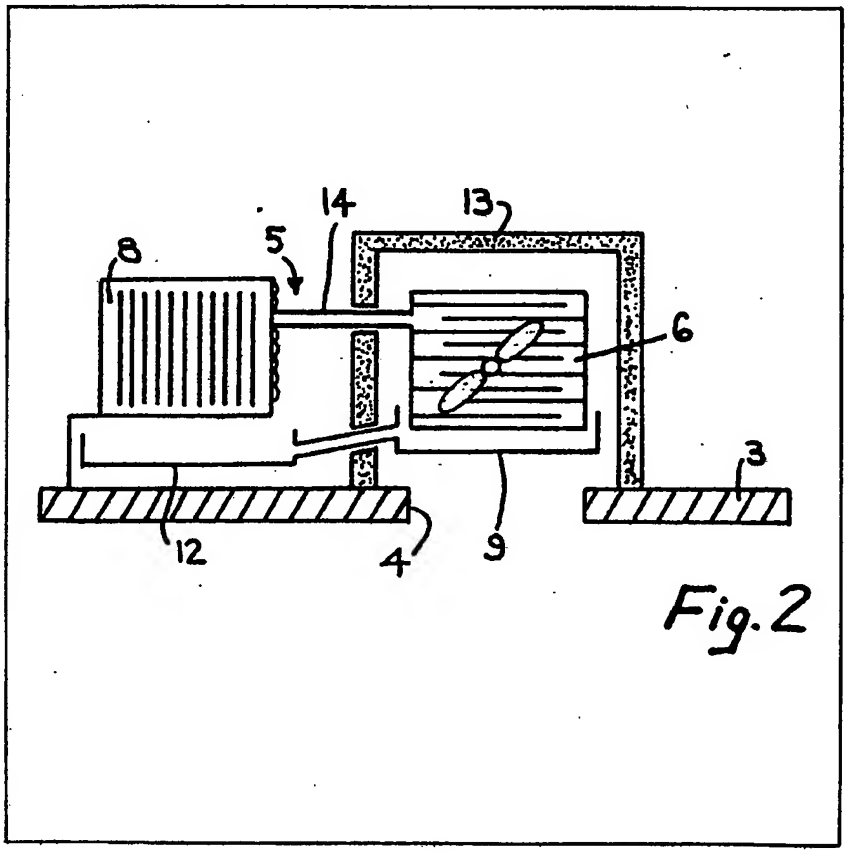

Fig. 2

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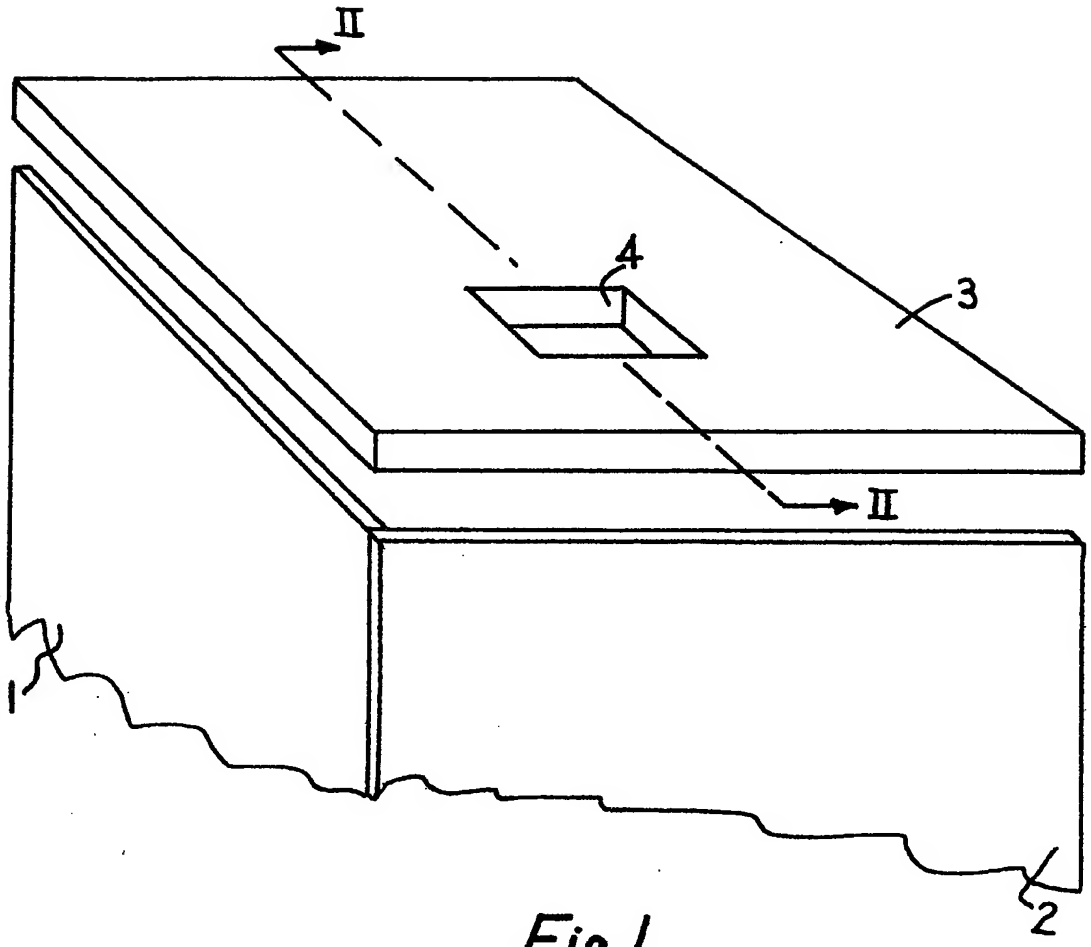

Fig. 1

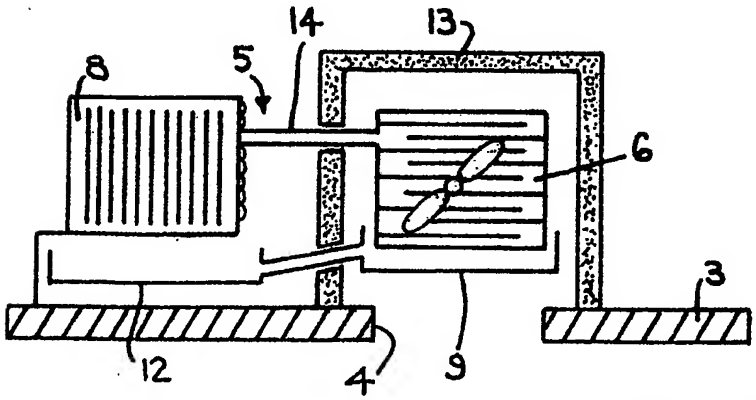

Fig. 2

SPECIFICATION

Refrigeration assembly

Field of the Invention

This invention relates to refrigeration assemblies for commercial refrigerators which are used in hotels, restaurants, shops and similar commercial establishments. The term refrigerator is intended to include freezers and coolers.

Background to the Invention

Commercial refrigerators should be reliable in operation and simple to service and maintain because of the large amounts of food which they are required to store. The invention aims to provide a refrigeration assembly in which the operative parts are combined in a self-contained unit which is easily replaceable with minimum disturbance to the cooled chamber of the refrigerator. A further object of the invention is to enable such an assembly to be used with a cabinet or with any other enclosure such as a cold room or cold store.

Summary of the Invention

According to the invention a commercial refrigeration assembly comprises walls for forming an enclosure, a sealed refrigeration system for fitting to the enclosure to refrigerate a chamber of the latter, the refrigeration system including an evaporator with a fan for drawing air from the chamber over the evaporator to cool the air, and a condenser for removing heat taken in by the evaporator, wherein the system is removable as a self-contained unit from the enclosure which has an aperture enabling air to be drawn by the fan from the chamber, cooled by the evaporator and thence returned to the chamber, and wherein the evaporator and fan are enclosed by an insulated casing which fits over the aperture, the condenser lying outside the casing.

The system may be located with respect to the enclosure in any desired position, such as beneath the enclosure or to one side thereof, but a preferred arrangement is for the refrigeration system to be located on top of the enclosure. In this case the aperture is arranged in the top wall or roof of the chamber with the evaporator and fan being located on top of the aperture and the condenser being located above but to one side of the aperture.

The walls of the enclosure may define a cold room or cold store, part of which may be formed by existing walls of a building. For example, a cold room or cold store may be built into a corner of an existing room by use of the necessary panels so as to form the required enclosure. In this case the aperture is preferably formed in a top wall or roof panel with the evaporator and fan enclosed by an insulated box which fits over the aperture. It will be appreciated that the condenser should lie outside this insulated box for cooling purposes.

As a result of defrosting, refrigerators produce condensed water which is conventionally evaporated by means of an electric heater. This is a very expensive and inefficient use of power, and in the preferred embodiment of the invention the heat output from the condenser is used to evaporate this water. This is conveniently achieved by arranging a drip tray underneath the evaporator and leading any water which collects in the drip tray into a separate vaporizer tray positioned underneath and close to the condenser.

An embodiment of the invention will now be described by way of example with reference to the accompanying drawings, in which:

Figure 1 is a perspective view showing a refrigeration enclosure before fitting of a refrigeration system, and

Figure 2 is a diagrammatic sectional view on the line II—II of Figure 1, showing the refrigeration system in position.

Detailed Description of the Drawings

Figure 1 illustrates the enclosure of a commercial refrigerator in the form of a cold room. The enclosure is formed by two side walls 1 and 2 and a top panel 3. The walls 1 and 2 and the panel 3 are fitted together at the corner of existing walls to form a cold room. The wall 1 or 2 will normally be provided with a door (not shown) to enable access to be gained to the cold room.

The top panel 3 has therein an aperture 4 over which is fitted a sealed refrigeration system generally indicated at 5 in Figure 2. The refrigeration system 5 comprises an evaporator 6, a fan 7, a condenser 8, a condenser fan (not shown) and a compressor.

A drip tray 9 is positioned beneath the evaporator 6, a downwardly inclined pipe 10 leading from the drip tray 9 to a vaporizer tray 12 located beneath the condenser 8. A casing in the form of a thermally insulated box 13 is positioned over the aperture 4 so that an opening in the box 13 registers with the aperture 4. The box 13 encloses the evaporator 6, suitable apertures or slots being provided in the insulating box 13 for the pipe 10 and for a further pipe 14 providing communication for the refrigerant between the evaporator 6 and the condenser 8.

The refrigeration system 5 can be fitted onto the panel 3 as a self-contained unit, and may be replaced very simply for service or maintenance purposes. If desired, the drip tray 9, pipe 10 and vaporizer tray 12 may be a separate sub-assembly which is not removed when the operative parts of the refrigeration system (the evaporator 6, the fan 7, the condenser 8 and the motor) are removed.

In use the fan 7 draws air from the chamber within the enclosure, through the aperture 4, over the evaporator 6 and thence back into the chamber as cold air. Heat is removed from the refrigerant by means of the condenser 8. It will be appreciated that the evaporator 6 should be insulated from the surroundings whilst the condenser 8 is desirably exposed to the surroundings for cooling purposes.

Any water condensing on the evaporator 6 falls into the drip tray 9 and thence flows into the

vaporizer tray 12 by means of the pipe 10. Heat from the condenser 8 evaporates water in the vaporizer tray 12 without any further power being needed for this purpose.

In practice, the pipe 14 would be closer to the pipe 10, the insulated box 13 having a short slot to enable the box 13 to be fitted in the position shown in Figure 2.

The described refrigeration system is designed for ease of installation and service. The system may be powered through a 13A plug/socket, and the mounting of the system outside the enclosure allows maximum use of refrigerated space.

CLAIMS

1. A commercial refrigeration assembly comprising walls for forming an enclosure, and a sealed refrigeration system for fitting to the enclosure to refrigerate a chamber of the latter, the refrigeration system including an evaporator with a fan for drawing air from the chamber over the evaporator to cool the air, and a condenser for removing heat taken in by the evaporator, wherein the system is removable as a self-contained unit from the enclosure which has an aperture enabling air to be drawn by the fan from the chamber, cooled by the evaporator and thence returned to the chamber, and wherein the evaporator and fan are enclosed by an insulated casing which fits over the aperture, the condenser lying outside the casing.

2. An assembly according to claim 1, wherein the system is located beneath the enclosure or to one side thereof.

3. An assembly according to claim 1, wherein the refrigeration system is located on top of the enclosure.

4. An assembly according to claim 3, wherein the aperture is arranged in the top wall or roof of the chamber with the evaporator and fan being located on top of the aperture and the condenser being located above but to one side of the aperture.

5. An assembly according to any of the preceding claims, wherein the walls of the enclosure define a cold room or cold store.

6. An assembly according to claim 5, wherein part of the cold room or cold store is formed by existing walls of a building.

7. An assembly according to any of the preceding claims, wherein the casing is in the form of an open box, the box opening registering with the aperture.

8. An assembly according to any of the preceding claims, wherein the heat output from the condenser is used to evaporate the water.

9. An assembly according to claim 8, wherein a drip tray is arranged underneath the evaporator and means are provided to lead water in the drip tray into a separate vaporiser tray positioned underneath and close to the condenser.

10. A commercial refrigeration assembly constructed and arranged substantially as herein particularly described with reference to the accompanying drawings.

Printed for Her Majesty's Stationery Office by the Courier Press, Leamington Spa, 1984. Published by the Patent Office, 25 Southampton Buildings, London, WC2A 1AY, from which copies may be obtained.